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ABSTRACT

Cable television communications are an advance in technology which promises profound changes in the way people live and communicate with each other. However, to take advantage of the opportunities that the cable provides requires thoughtful evaluation and careful policy making. This booklet is designed to provide an introduction to the potential of cable communication by examining the way it works as well as the forces that have shaped it and the major issues that surround it. The technical and engineering aspect, the economic and legal considerations, and the future of cable television are covered in summary. (MC)

Cable Television
Information Center
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Cable: An Overview

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PREFACE

This document was prepared by the Cable Television Information Center under grants from the Ford Foundation and the John and Mary R. Markle Foundation to The Urban Institute.

The primary function of the center's publications program is to provide policy makers in local and state governments with the information and analytical tools required to arrive at optimum policies and procedures for the development of cable television in the public interest.

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CABLE: AN OVERVIEW

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CABLE TELEVISION INFORMATION CENTER
The Urban Institute
2100 M Street, N.W., Washington, D.C. 20037

Cable: An Overview

INTRODUCTION

. . . CATV could change the country's way of life. Its copper coaxial cables, though larger than telephone cord, have 1,000 times the communications capacity. Washington willing, the U.S. could be transformed into what some call "the wired nation." Within ten years, CATV's two-way conduits could provide set-side shopping and banking, dial-a-movie service, a burglar and fire watch, and facsimile print-outs of newspapers or even library books.

Time *Magazine, June 1, 1970*

Cable communications is an advance in technology which promises profound changes in the way people live and communicate with each other. It can be a unique technological advance if society accepts its opportunity to shape and control cable before it becomes fixed in place.

This century has seen the introduction of several major technological innovations, including the automobile, the electronic computer, and television, which have altered our lives in many ways. Instead of making conscious, explicit decisions about the development of these devices, however, too often American society has allowed technology to work its own way, forcing unintended and undesired consequences on us.

Now cable television looms on the horizon, offering a potential for change comparable to these earlier innovations. Currently cable TV subscribers in a number of areas are receiving better television reception and access to more channels. But the promise of broadband cable communications is its capacity to carry more kinds of messages faster than existing means of communication and its capacity for two-way communication. Thus, it raises the prospect of a vast array of new kinds of services.

Cable could decentralize television programming and broadcasting, enabling new voices to speak to new audiences. It promises to facilitate selection of merchandise at home. The Sloan Commission on Cable Communications predicted a critical role for cable as a delivery system for such important public services as education, health care, and sampling political opinions. Equipped with a print-out device, cable could provide a means of delivering mail and distributing reading matter. It could have an effect comparable to the computer in transforming commerce and research, and changing the way we store and retrieve information.

Moreover, cable communications promises to become a new industry which will require large capital investments, employ thousands of men and women, and generate considerable profits, while altering existing patterns of commerce and employment.

Thus, cable communications may reshape urban life, but not automatically to our advantage. One study suggests that educational programming on the cable can help rebuild ghetto communities,[1] while another speculates that cable could further divide and isolate people by race and geography.[2] While some observers see it as a means of providing new services in everyone's home, others fear it may stifle personal contact and limit the human interaction that is such an important part of urban life.

Like the automobile or airplane or computer, cable communications can have positive or negative social consequences, depending on how we deal with it. What distinguishes cable communications from earlier technological innovations is that its potential impact has been recognized. We have the opportunity to establish ground rules that will control the direction and maximize the benefits of cable communications. To take advantage of this opportunity, however, requires thoughtful evaluation and careful policy-making.

Cable: An Overview is designed to provide an introduction to the potential of cable communications by examining the way it works as well as the forces that have shaped it and the major issues that surround it.

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[1] H.S. Dordick *et.al., Telecommunications in Urban Development* (Santa Monica, California: Rand Corporation, July 1969), p. 61.

[2] N.E. Feldman, *Cable Television: Opportunities and Problems in Local Program Origination* (Santa Monica, California: Rand Corporation, September 1970), p. 24.

HOW CABLE WORKS

Technology has always been CATV's strongest asset, and the more forward-looking members of the industry anticipate that CATV will revolutionize not only television, but all of electronic communications.

National Observer, *July 7, 1969*

Cable communications differs from broadcast television in that its signals are sent over a network of coaxial cables instead of being transmitted through the air. This difference in the method of transmission not only provides better television reception and access to more channels, it also holds the potential for special programming and special services.

Impulses sent through the air from a television transmitter are often deflected by tall buildings and mountains and weakened by distance, so that reception varies among homes. Transmission by cable provides television signals with a controlled path to the receiver, a path which is protected against interference from obstacles and other signals in the air and which is amplified to maintain its strength over long distances, so reception is uniformly good.

Cable communications also provides more television channels than broadcast television since it allows use of channels that are adjacent to each other without signal interference. Broadcast television can rarely allow more than seven of the 13 VHF channels to operate in any one city, because of the scarcity of channel space in the electromagnetic spectrum. Electromagnetic waves of about the same frequency will interfere with each other as they travel through the air, distorting the TV picture. Thus, when the Federal Communications Commission allocates channels, it cannot allow broadcasters to use adjacent channels in the same area because of this "co-channel interference."

Moreover, television has dozens of competitors for electromagnetic spectrum space, such as radar and other military transmissions, meterological aids, aeronautical and maritime navigation and police radios. All of these uses are expanding, creating heavy demand for scarce channel space. Unlike these others, television, which occupies 53 per cent of the most useful frequencies of the spectrum, can use cable instead of the airwaves. Transmitting television signals by cable not only frees much of the spectrum for alternative uses and largely eliminates signal interference, it also provides access to more television channels.

In addition to the portion of the spectrum allocated to VHF television (54 - 88 megahertz (MHz) and 174 - 216 MHz) cable can carry the frequencies that broadcast television cannot use. A cable system can use the mid band frequencies (108 to 174 MHz) which are currently used for aeronautical and mobile communications, and it can also transmit data on the sub band (5 - 54 MHz) which is now used for mobile communications. Moreover, the super band, the spectrum space above 216 MHz, is now used for aeronautical and mobile communications and UHF television. With set converters these frequencies can also be used to carry television channels on the cable.

Because cable television can theoretically offer an almost unlimited number of channels with clear reception, it has been called "the television of abundance." Yet its broad band width enables coaxial cable to facilitate other kinds of communications as well. Voice and data channels, for example, require much less spectrum space than television. A two-way data channel, which can poll 20,000 to 30,000 homes every few seconds to see if they wish to initiate communications, requires only four MHz of spectrum space. Moreover, cable systems can also transmit FM radio signals, since the entire FM portion of the electromagnetic spectrum lies between television channels six and seven.

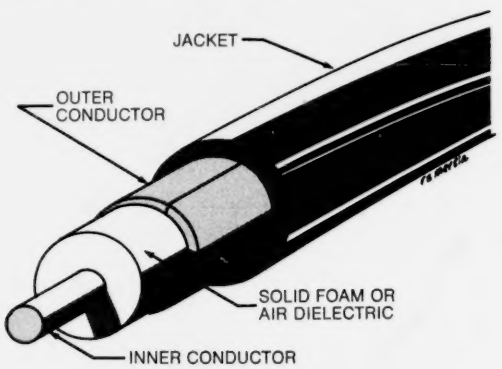
While cable systems differ in many respects, all have certain universal features. The system's three basic components are the headend, the cable network, and the terminal.

The Headend

At one end of the system is the headend, where television signals are originated or picked up from the air by antennas or microwave receivers. These signals are then processed, amplified and sent down the cable. The headend facility may include channel processors which receive signals from local over-the-air television stations as well as microwave antennas and demodulating equipment for receiving signals from great distances. If some programming is produced locally, the headend is connected to the studio equipment and television modulators.

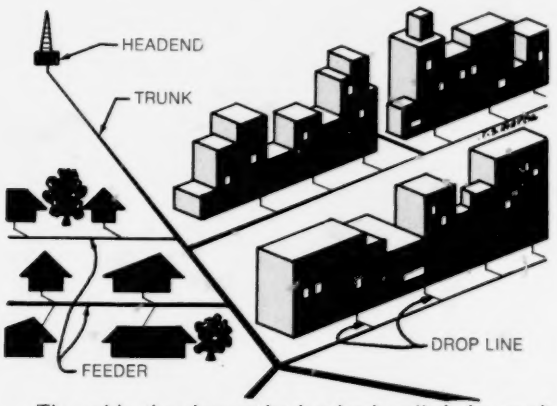
The Cable Network

On the outside, coaxial cable looks something like telephone wire. It has a narrow inner conductor, made of copper wire, a larger outer conductor made of extruded aluminum, and a layer of plastic foam that keeps them



apart and maintains an electric field between them. An outer plastic sheath protects the cable from weather or whatever else might affect the system's operation.

After the distant broadcast signals are received or local ones originated, they are strengthened, converted to the proper frequencies, and distributed over the cable through what is sometimes referred to as a "trunk-branch" system.

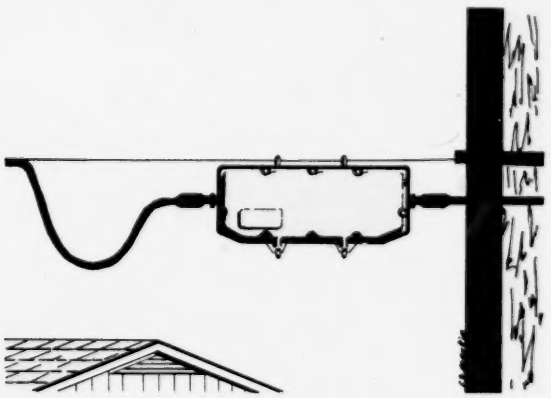


The cable that leaves the headend, called the trunk line, is about one-half to three-quarters of an inch in diameter. To distribute the cable to subscribers' homes, the trunk line is connected to smaller feeder lines. Finally, individual drop lines run into each household.

If coaxial cables are strung above ground they are usually suspended on poles belonging to the telephone or power companies, which are rented to the cable operator at negotiated rates.

The cable may either be buried directly in the ground, run through submerged plastic pipes or included in underground utility conduits. Although underground construction is almost always more expensive, some communities require it to protect the appearance of the town.

Amplifiers are inserted about every two thousand feet throughout the distribution plant to keep the signals from losing strength.



Performance standards limit the number of amplifiers that can be connected in line on one coaxial cable to about 25 trunk amplifiers, spaced 2.8 amplifiers per mile of 3/4-inch cable. This rule of thumb implies that trunk lines cannot extend more than approximately eight miles from each headend without unacceptable loss of signal quality.

The Terminal

The home terminal is at the end of a cable system. In its simplest form, the terminal consists of a television set and connectors that join it to the coaxial cable. But with the advent of new cable services, a home terminal might include more complex equipment, such as set converters.

A converter extends the capacity of a conventional home receiver beyond the 12 VHF channels, and protects the receiver against interference from strong local over-the-air signals. The converter also transforms all channel frequencies coming in on the cable to a single frequency, an unused channel on the VHF dial. The subscriber sets the dial on that channel number and selects cable channels by using a tuner knob on the converter. Another solution to the limitations of television receivers is to install two cables and a simple switch so that subscribers can select channels from either cable. This approach expands channel capacity without a converter.

In the future, the Rand report on interactive television suggests, a terminal may also include a videotape recorder; a facsimile receiver to receive and print out newspapers or third class mail that is "delivered" by cable; an alphanumeric keyboard to send messages back to the headend; and a computer control center to keep track of the sending and receiving of information.

Two-Way Communications

Using a separate cable, or different frequencies on the same cable, signals can also be sent from the terminal back to the headend, or, eventually, among the subscriber terminals. The FCC has required some form of send-and-receive or two-way capacity for all new cable systems in the top 100 television markets.

Cable communications is well suited for rapid two-way interaction between many subscribers and a central information processor, an arrangement that would be useful in opinion polling, market research, meter reading, and other processes that require only small amounts of return data. These will probably be the first kinds of two-way cable made available to the public.

The ultimate extension of two-way cable is simultaneous, two-way video, such as that required for videophones. At this point, the switching equipment required is prohibitively expensive, and even the ample bandwidth of coaxial cable would be hard pressed to provide sufficient television channels for private use in a typical cable system.

To date, only a few small communities and small sections of larger cities offer two-way capacity, and these are largely experimental. Manufacturers have yet to mass produce reliable equipment for two-way cable. Another factor which has slowed the adoption of two-way cable is economics. It is not clear what two-way will cost or how many people will be willing to pay for it. One Rand Corporation study estimates that adding two-way capacity to a single cable system would add 15 to 30 per cent to the capital cost of a one-way system.[1]

A Mitre Corporation report on urban cable systems finds that subscriber response services will almost double the cost of one-way cable.[2]

Individual subscriber terminals for two-way operation now cost between $200 and $300. Although costs will fall as the production of terminals increases, for the next three years the price is not expected to drop below $100 to $250 for each user in a 5,000 terminal system.[3]

Interconnection of Systems

Another important development in cable technology, one which seems closer than complete two-way transmission, is the interconnection of cable systems to provide a variety of networks for distributing programming regionally or nationally. Ad hoc groups of cable TV systems could easily arrange to carry a particular program of common interest to their subscribers. Some headends can be interconnected through microwave or cable relay systems, but the most promising form of interconnection for the immediate future appears to be domestic communications satellites.

Satellites, once launched, would make available a far greater degree of interconnection at about half the cost of more traditional means of interconnection, according to the 1971 report of the Sloan Commission on Cable Communications.[4] Several aeronautical and communications corporations have applied to the FCC for permission to build the first such satellite, which will serve a substantial number of cable systems through ground receiver stations at or near their headends. Programming interconnection by satellite is expected to be in operation by 1974 to 1975.

[1] Walter F. Baer, *Interactive Television: Prospects for Two-Way Services on Cable* (Santa Monica, California: Rand Corporation, November 1971), p. 56.

[2] William F. Mason, et. al., *Urban Cable Systems* (McLean, Virginia: The Mitre Corporation, May 1972), p. 11-41.

[3] Baer, *Interactive Television*, p. 58.

[4] Sloan Commission on Cable Communications, Report of the Commission, *On the Cable: The Television of Abundance* (New York: McGraw Hill Book Company, 1971), p. 42.

THE ECONOMIC AND LEGAL FRAMEWORK

. . . the Task Force believes that cable television offers the most promising solution to a number of difficult problems facing our larger cities. It can solve the problem of interference with television reception. It can ease the crowding of the electromagnetic spectrum, which is already referred to as "the silent crisis." It can provide a multiplicity of channels to help meet the expanding needs of a modern urban society for channel space.

Mayor's Advisory Task Force on Telecommunications in New York City, September 1968

The Origins

The first cable systems were simple ones. They were built in Pennsylvania and Oregon in the late 1940s to bring television signals to isolated communities where TV reception was blocked by mountains or weakened by distance.

In these communities, an enterprising operator would erect an antenna on a tower, high building, or mountain to catch broadcast signals and connect his antenna to a coaxial cable which was linked to the homes of subscribers who paid a monthly fee. Cable provided clear reception, and in some areas offered the added service of television signals from more than one city. This system was called Community Antenna Television, or CATV.

The first cable operators, usually local businessmen, had few restrictions on their new enterprises. They absorbed high depreciation costs as tax losses in the early years of the system's operation, creating a highly profitable business in later years.

The FCC chose to exercise no authority over cable, and most state governments took no notice of the new technology, so local governments were the only regulators of cable television during its first decade. They became involved because cable operators distributed their cables over public property and needed permission to use rights-of-way. Since cable TV was regarded as a service to their residents, municipalities routinely granted cable operators permission to build their antennas and cable lines.

The broadcast television industry, itself a relative newcomer then, also paid little attention to cable. In fact, television stations welcomed cable systems as a means of extending their service areas and increasing the size of their viewing audiences.

At first, cable operators offered their subscribers only one or two, then five, channels of CATV. Even with this limited service, cable television spread rapidly to small towns throughout the country. In 1952, there were 70 cable TV systems with 14,000 subscribers; 10 years later, according to *Television Digest*, there were 800

systems with 850,000 subscribers. Though still a small industry, cable TV was a largely unfettered one until the 1960s when cable technology became more sophisticated and the growing industry attracted more attention.

Expansion

In the early 1960s the introduction of channel processors and other new techniques which allowed adjacent channels to be carried on the cable increased the potential channel capacity of a CATV system to 12 channels. The development of wideband solid state amplifiers raised channel capacity to 20 channels at the end of the decade. Most systems began to carry UHF and VHF signals from one or two other cities ("distant signals") besides the signals from the nearest television stations.

Dozens of systems also began to offer some form of locally originated programming. Usually it was automatic origination such as news and stock market tickers, music, or time and weather information, but some systems also cablecast local news or advertisements.

By 1965, *Television Factbook* recorded 1,325 operating systems with 1,275,000 cable subscribers. Although cable TV was still mostly a rural and small town phenomenon, many cable operators were looking towards the cities, where almost 90 per cent of their potential audience lived.

The structure of the industry was also evolving during the 1960s as small, individually-owned cable systems began to be subsumed by chains of cable systems. Multiple system operators (MSO's) bought out small cable operators and merged with each other, so rapidly that in 1972, a National Cable Television Association (NCTA) survey estimated that only one-quarter of all cable TV subscribers were served by individually-owned systems.

Almost 60 per cent of the nation's subscribers are served by systems owned by the 25 largest MSO's, which also frequently own or supply other communications media: newspapers, radio and television stations, magazines. Suppliers and distributors of programming for cable systems have also tended to merge into larger corporations.

Local Regulation

The changes in the nature of the industry have led to corresponding changes in the kinds of government regulation developed for cable television, and to changes in the attitudes of other industries. As cable technology became more sophisticated in the early 1960s many city officials came to realize that there was more to gain from their CATV franchises than additional television shows for their citizens.

Since cable was a profitable, rapidly expanding business, cities began to recognize cable franchises as potential sources of revenue for their hard-pressed treasuries, and they soon were demanding a share of the cable system profits. Usually the fee amounted to three or four per cent of total gross subscriber receipts, but one system in Colorado pays from five to 35 per cent on a sliding scale based on a gross income, and a few systems pay even more. Some municipalities required liability insurance for injury, property damage and copyright infringement. Others required free cable installation for municipal buildings as a substitute for direct revenue.

Special interest groups also helped shape cable TV franchises. Theater owners in some cities, for example, fought for, and won, clauses which prohibited pay television. Blackouts of local sports events were written into some city franchises where team owners feared that games televised on cable or over-the-air would cut into their gate receipts.

In the early stages of cable franchising, there was still little consideration of many basic features of cable operations, such as the number of channels, subscriber rates, program origination, and construction schedules. As a result, many ordinances contained serious flaws. Local officials often granted franchises hastily; these franchises frequently ran for 25 years or longer, while imposing few affirmative requirements upon the operator. Once a franchise was awarded for a lengthy period, cities lost their bargaining power and their control over the cable system.

Because some franchises didn't include construction timetables, some franchise holders delayed or never even began building the systems, preferring to buy and sell franchises like investment securities. In some cities, operators were free to wire the more affluent sections and bypass poor neighborhoods. Many systems were allowed to install limited capacity and omit local programming. There was generally no mechanism for consumer complaints.

This period of local control over cable's development also was marred by corruption in the seeking and awarding of franchises. In one instance, an officer of a large national cable company was convicted of bribing local officials to win franchise rights. Several local officials were accused of accepting the bribes.

More recently, local authorities have come to understand the importance of sound decisions on cable television and their responsibility in helping to make them. Cities frequently establish study committees to gauge local cable needs and recommend procedures for meeting them. Franchise awards have become distinctly more deliberate, the process of studying cable, writing an ordinance and awarding franchises often taking a year or longer. Finally, a combination of federal regulation and increased public awareness have led to fuller community participation in cable decisions.

Federal Regulation

The growth of the cable industry began to concern broadcasting and other industries which saw their commerical territory being invaded by cable. Local television station owners feared that cable systems would lure away their viewers, cutting their audience size and advertising revenues. Small UHF stations, in particular, claimed they would fail if viewers deserted them for the better reception and greater program diversity of cable TV.

Large broadcast groups and networks were not only concerned about the financial health of their local affiliates but were worried that cable systems might combine to outbid them for programming. Broadcasters also claimed that cable operators enjoyed the advantage of not paying copyright fees for the programs they carried.

The growing pressure for regulation of the cable industry led the Federal Communications Commission to exercise steadily increasing authority over cable communications.

The FCC was established by the Communications Act of 1934 to regulate interstate and foreign commerce in communications.

It must allocate frequencies to ensure that radiated signals do not interfere with each other in the crowded electromagnetic spectrum. In addition, the commission is charged with ensuring "the widest possible dissemination of information from diverse and antagonistic sources."[1]

Because even early cable systems could carry five to 12 channels without signal interference, the need for federal regulation of CATV did not seem apparent. As late as April 1959, the FCC still found no basis to assert its authority over cable television systems.

The first step towards federal regulation came in 1962. In the *Carter Mountain*[2] ruling, the FCC prohibited microwave companies from relaying distant television signals to CATV systems when they would duplicate the programming of local television stations. This protection of VHF and UHF broadcasters from competition by cable was a recurrent motive in FCC rulings during the 1960s.

In April 1965, the FCC issued its *First Report and Order* on cable television, asserting jurisdiction over microwave-fed systems. In accordance with its belief that CATV should supplement, not replace, broadcasting, the commission recommended "a reasonable measure of exclusivity" to protect program suppliers and television stations.

In its *Second Report and Order*, issued the following year, the FCC claimed jurisdiction over all cable systems and adopted rules governing their practices. The Supreme Court, in its 1968 *Southwestern*[3] decision, supported the FCC's authority over cable television as long as it was "reasonably ancillary to the effective performance of the Commission's various responsibilities for the regulation of broadcasting . . . ."

The *Second Report and Order* in effect prohibited importing distant signals to the top 100 markets, thus removing one of cable television's primary attractions for urban viewers. From that time until March 1972, when the FCC issued its *Third Report and Order*, cable companies stayed out of nearly all big cities. Without distant signals to provide attractive programming, the city markets were considered unlikely to support new cable television systems.

The FCC seemed to alter its approach in the *Midwest Video* case and in its *Third Report and Order*. In the *Midwest Video* decision in October 1969, the FCC required cable systems with more than 3,500 subscribers to originate some programming, which could be financed by advertising in natural program breaks. The Supreme Court upheld this ruling in 1972.[4]

In March of 1972, the FCC completed its *Third Report and Order*, called the *Final Cable Television Decision* at the time of its release. This governed various aspects of cable television, including signal importation, channel capacity, two-way capacity, and access to channels, while leaving certain decisions to local authorities.

Thus, there seem to have been three distinct phases in the FCC's response to cable television. The commission initially avoided regulation of cable television on the grounds that the new technology was outside its jurisdiction. When cable came to be viewed as a threat to broadcasting, however, the FCC assumed jurisdiction over it, and regulated it to protect over-the-air television. Finally, with the *Midwest Video* ruling and the *Third Report and Order*, the FCC moved toward encouraging the development of cable television as a separate and valuable public service.

State Regulation

While the FCC has come to accept cable television as an important new communications medium, the same battle that raged before the FCC and the courts is shaping up again at the state level. State governments are the most recent participants in the regulation of cable TV. Eight states have authorized some form of statewide cable regulation at this writing, and proposals are under discussion in many others.

Proponents of state regulation argue that local franchising authorities have difficulty making independent decisions about cable television because they lack the expertise and resources for such decisions.

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[1] *Associated Press* v. *U.S.*, 326 U.S. 1 at 20 (1945).

[2] *Carter Mountain Transmission Corp.* v. *Federal Communications Commission*, 361 F. 2d 359, certiorari denied, 375 U.S. 134.

[3] *Southwestern Cable Company* v. *U.S.*, 392 U.S. 157 (1968).

[4] *United States* v. *Midwest Video Corp.*, 406 U.S. 649 (1972).

A permanent state staff with ongoing surveillance of local cable franchising would develop the necessary sophistication, some state officials argue. Moreover, state governments have the authority to arrange regionalization and ensure interconnection where cable TV decisions may transcend local political boundaries.

New Jersey and New York enacted year-long moratoria on franchise decisions in 1971 while their legislatures sought to devise some state regulatory plan after incidents of bribery and extortion came to light.

However, there is disagreement about the form such regulation ought to take. The first states to regulate cable television regarded it as a public utility, a business operating in the public interest which constitutes a local monopoly and is subject to special governmental regulation. Connecticut, Nevada, Rhode Island, Vermont and Hawaii all placed cable under the authority of their state public utility commissions before 1971.

The majority of the cable industry opposes state regulation by public utility commissions, insisting that young, growing industries cannot function under the kind of regulation imposed on large, established ones. They add that cable is not a necessity and therefore should not be classified as a utility.

Adding a third tier of cable regulation may be duplicative and cumbersome, causing delay and additional red tape for local cable systems. Local governments insist that regulation should rest with the level that is most accessible to local citizens.

The Sloan Commission recommended establishment of special state agencies to direct and regulate cable growth in conformity with federal standards, and several states are following this pattern. The Massachusetts Act, for example, leaves most franchising in local hands but establishes minimum state requirements administered through a Community Antenna Television Commission within the state's Executive Office of Consumer Affairs. The New York legislation also sets up an independent, bipartisan commission to develop and implement a statewide communications policy.

South Dakota passed cable regulations in February 1972. Cable regulation is also under discussion in a number of other states including Illinois, New Jersey and Wisconsin.

Who's Who

In the battles over the nature of cable regulation, while individual cable operators and firms often speak for themselves, the cable industry is generally represented by the National Cable Television Association, headquartered in Washington, D.C. In 1972, 1,200 cable systems were NCTA members and 250 equipment manufacturers, distributors and cable-related firms were associate members. Almost 40 independent state and regional cable TV associations cooperate with the NCTA.

The NCTA has charged that the FCC protects powerful broadcasters at the expense of the public, which wants and is willing to pay for cable television. The Justice Department supported this view in a memorandum to the FCC while the commission was considering its cable rules in 1971 and 1972.

Concerned that over-regulation will stunt cable's growth and cut the industry's profits, the NCTA has also argued that cable is neither a public utility nor a common carrier. Moreover because the industry fears state regulation as much or more than federal regulation, NCTA insists that cable TV is engaged in interstate, not intrastate, commerce.

Broadcasters traditionally have protested that cable television will siphon off viewers and advertising revenues, and that cable operators have an unfair advantage because they pay no royalties for their programming. The broadcasting industry has also argued that over-the-air television is an important communications medium which should be protected, and that small-town stations and UHF stations may be forced out of business if cable is permitted to invade their territory.

The most powerful representative of broadcasting interests has been the National Association of Broadcasters (NAB), whose 4,355 members include radio and television stations, four national radio networks and three TV networks, as well as producers of equipment and programs who are associate members. Networks have also spoken out on their own behalf.

Until recently, the group that had no lobbyists to defend its interests in the cable controversy was the public. However, in the early 1970s the movement for greater citizen participation and public responsibility in all areas spread to cable communications. A number of citizen organizations were formed to educate and mobilize the public to demand that cable develop in the public interest.

Such groups have taken an active interest in various aspects of cable communications including local franchising decisions, alternate types of programming, minority group participation, and public access to the medium. A number of groups have also filed petitions with the FCC to participate in federal as well as local decisions about cable television.[1]

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[1] Examples include Publi-Cable Inc. and the United Church of Christ's Cable Advisory Group in the public interest and franchising areas; Open Channel in Manhattan and the Alternate Media Center at New York University in the public access and programming areas; the Urban Communications Group in Washington, D.C., in the area of minority ownership and applications. Community video projects have been started in Washington (Community Video Center), New York (Raindance), Cambridge, Massachusetts (Earth Light Video), and dozens of other cities and college campuses.

THE FUTURE OF CABLE COMMUNICATIONS

The Industrial Electronics Division, Electronic Industries Association views the services to be provided by broad-band communication networks in the late '70's and early '80's of landmark importance. We look upon such systems as being of 'national resource' dimensions and the development of these resources as a national goal.

Comments of the IEA/EIA before the FCC, October 29, 1969

Now that the FCC has agreed to permit the expansion of cable television, and state legislatures are arriving at their individual solutions to the complexities of cable regulation, perhaps cable TV can go on to meet the demand for its services. But a number of questions as to the size and nature of that demand remain unanswered. After more than 20 years, the cable industry is still comparatively small. Its total revenues were about $360 million in 1971. This means there were almost 300 individual corporations in the United States with sales revenues greater than the entire cable communications industry.

The potential for growth appears impressive: only nine per cent of the nation's television households are on the cable. But most of the untapped cable markets lie in the cities, and urban cable systems are still largely unknown quantities. Construction costs in cities may run several times higher than costs in less populated areas. Where people can receive a number of over-the-air signals without cable TV, cable has to offer other services to attract subscribers. Many of these services are very costly to install and operate, and their economic attraction is uncertain. New York's Sterling Manhattan system, in a tight race with San Diego's Mission Cable to be the nation's largest cable system, lost $2.5 million in fiscal 1971 and $3.7 million in 1972.[1]

Penetration, the basis of cable's profitability, is another critical factor. The industry generally predicts that 60 per cent of the nation's homes will be wired by 1980. The Sloan Commission's report concurred on a 40 to 60 per cent penetration figure, with substantially higher penetration in metropolitan areas. But more pessimistic analysts have concluded that penetration will reach only 15 per cent by 1975, and that substantial profits for the new cable services are still two decades away.[2]

The future of cable television will also hinge on certain basic regulatory issues which are still unresolved. One persistent problem is copyright law. Networks and television and movie producers claim that cable systems should not be permitted to retransmit network programming without paying royalties, since it gives them an unfair advantage in bidding for programming.

The Supreme Court, in the 1968 *Fortnightly*[3] decision, ruled that the matter was not covered under existing copyright law, since cable transmission of shows did not constitute "performances." The effect of this decision was to absolve cable operators from paying copyright fees. In 1972, a U.S. District Court in New York affirmed this point, ruling that TelePrompTer Corporation had no copyright obligation to CBS for carrying its programs. The decision is being appealed. While negotiations between broadcasting, copyright and cable interests continue, all parties are waiting for new copyright legislation from Congress to resolve the matter.

Another matter of increasing concern is the question of whether cable TV ought to be operated as a common carrier, furnishing communication service to anyone upon reasonable request at nondiscriminatory rates. Advocates of common carrier status for cable communications such as the American Civil Liberties Union, see it as a way of facilitating freedom of expression and avoiding possible censorship by operators. Since programming would be divorced from ownership, organizations now prohibited from owning cable systems such as telephone companies, might be able to re-enter the field. Opponents of common carrier status argue that separation of content and ownership at this point would hinder the development of cable.

The FCC's *Philadelphia Broadcasting*[4] ruling in 1965 held that cable television systems are not common carriers but this decision, too, may be reconsidered. The public access channels, for example, will be operated as common carriers, as will the leased channels. The FCC seems to be considering two courses: in its 1969 local origination decision, it required system operators to become involved in programming, while the commission's *Third Report and Order* promoted a kind of common carrier status.

The FCC is also considering the issue of "cross-ownership," i.e., whether and to what extent cable owners should be permitted to own other communications outlets and vice versa. Current rules forbid ownership of cable systems by broadcast television stations or telephone companies in their service areas and by television networks anywhere in the country.

Forms of ownership, in general, is an area which is only beginning to be explored. Traditionally, cable systems have been private, profit-making businesses, owned by entrepeneurs who invest capital in order to earn a return. But there are about 18 cable systems

[1] "Within The Network," *Broadband Communications Report*, July 25, 1972, p.8.

[2] Richard A. Donnelly, "The Dimmer View," *Barron's*, July 10, 1972, p.5.

[3] *Fortnightly Corporation* v. *United Artists Television, Inc.*, 392 U.S. 390 (1968).

[4] *Philadelphia Television Broadcasting Co.* v. *FCC*, 359 F, 2nd 282 (CADC, 1966).

owned by municipalities, mainly in small communities that did not seem to offer sufficient return to attract private entrepeneurs. About 35 other small systems are cooperatively owned by subscribers.

More recently many larger cities and metropolitan areas have begun to explore ownership models in which private ownership is supplemented or replaced by public or non-profit ownership.

In some cases, cities are considering plans to negotiate buy-back agreements to take control of the system after it is built and functioning profitably.

Many ownership schemes attempt to minimize the political problems of government ownership of a communications medium and take advantage of the capital resources of private industry. Some are exploring alternative forms of ownership which in some fashion combine roles for non-profit citizens organizations, neighborhood or community groups, profit-making corporations, and agencies of government.

The ownership question also raises the issue of minority group involvement in cable television. The local nature of cable television might enable minority groups to own the systems that cablecast in their areas, which would facilitate programming tailored to their needs and tastes. Moreover, cable will open up thousands of new jobs in communications, jobs which might be filled by minority group members. Some cable proposals include cooperative plans in which cities or private industry help provide minority organizations with the capital and technical skills needed to launch and operate a cable system.

Questions of ownership and structure have attracted such scrutiny because cable communications seems to promise fundamental changes in our way of life. It is entirely possible, of course, that cable communications will evolve into a medium like commercial television, with more channels, but the same limited range of content and uses. But most observers agree cable promises something more.

It is widely believed that cable television will not only be an entertainment medium, but also an important source of information and eventually an essential public service. Because it promises a system of economical, instantaneous two-way communications which doesn't require persons to leave their homes, cable communications is seen as a means of obtaining many services and selecting goods at home. It is also a means of obtaining medical diagnosis, health care, education, even of eliciting and expressing political opinions.

Some have speculated that cable communications will end the need for geographic proximity in communications, business, and education and reverse the long-standing trend toward increasing urbanization. If living within traveling distance of employment, cultural facilities, and shopping became unnecessary because of cable communications, a major shift and dispersion of population could result.

At this point, the ultimate sociological impact of this kind of complete, two way communications is indeterminate. It is unclear, for example, what two-way cable communication could do to the right to privacy. Two-way cable could be monitored from the headend to learn not only what channel a set is tuned to, but what information has been requested from libraries, what doctors have been contacted, perhaps even what mail has been delivered. Already, the prospect of cable communications being used as "eavesdropping" equipment in homes has caused some apprehension. Currently, the FCC requires two-way service to be installed in a manner allowing the subscriber to switch it off.

There is also uncertainty about the desirability of the "instant policy-making" that cable would allow via electronically polling viewers. The opinions expressed by those viewing, say, a cablecast of a city council meeting, might provide the policy-makers with the momentary passions of a few devoted viewers instead of accurately reflecting the views of the general public.

The localized programming facilitated by cable TV is also a matter of concern. Cable could facilitate interaction and dialogue between whites and blacks in central cities, for example, or it could segregate and isolate them even further by supplanting their common entertainment and information medium. Cable could help city and suburban dwellers cooperate in delineating and solving mutual problems, or it could assure that each group need never hear or see the other.

In short, the coming of cable communications promises many changes and raises many questions. While these questions cannot yet be answered, it is important that many Americans have noticed cable television while it is still developing. In earlier decades, new technologies arose, grew, and profoundly altered the lives of most of the population without anyone consciously deciding how the new technologies should develop and whose interests they should serve. Early recognition of cable's potential provides us with an opportunity to come to grips with a new technology before its course becomes unchangeable. Past errors, committed because technology was allowed to make its own way, are difficult to reverse. With cable communications, there is still time to direct its path. Our response to its potential represents a test of whether we will be able to control new technologies or whether we must be controlled by them.